THE AMERICAN JOURNAL

OF

OPHTHALMOLOGY.

VOL. XIX. MAY, 1902. No. 5.

ORIGINAL ARTICLES.

THE MISUSE OF GLASSES.*

By F. C. HOTZ, M.D.,

Professor of Ophthalmology and Otology, Rush Medical College, in Affiliation with the University of Chicago.

ON the 23d of January, when your secretary came to my office to urge me to accept your president's invitation to address this meeting, I had just finished the examination of the following case: A young man, 28 years of age, healthy and strong, living in a small country town, could not read or write much during the past two months, because soon after he began his eyes ached. He never had any headache and during school life his eyes never caused him any trouble. He remembered he had a cold shortly before the present trouble began. An oculist had prescribed glasses (+ 1D) which he had been wearing these two months, but without any relief.

The examination showed orthophoria, normal fundi; and under homatropine $V^{20}/_{16}$ with +. 75D. The retrotarsal folds of the upper lids were very red and slightly swollen. It was a plain case of conjunctivitis, and a few applications

*Read at the meeting of the Western Ophthalmologic and Oto-Laryngologic Association, held at Chicago, April 10, 11 and 12, 1902.

of protargol (5%) to the retrotarsal folds, followed by daily instillations of a solution of boric acid (2%) and alum (1/5%) relieved the patient within two weeks so that he could read again with perfect comfort for hours, though on my advice he had laid aside his glasses directly after the first visit.

This is one instance of many in which the discomfort caused by conjunctivitis is mistaken for asthenopia, and superfluous and useless glasses are inflicted upon the patient. An unprejudiced mind finds it difficult to understand how in this case an oculist could have pinned his faith upon the curative power of lenses when the whole history of the patient and the findings of the examination presented no evidence of eyestrain. The patient never had suffered from headache in his life and had not experienced the slightest eye trouble while in school. These facts, I think, are of the greatest significance: for the great demands our schools put upon the vital forces of a child, together with the greater susceptibility of the nervous system of the growing organism, render the period of adolescence an especially favorable field for the display of the disturbing effects of ametropia upon the nervous system. Slight degrees of ametropia are a prolific source of headaches during this critical period in life; and we have frequent occasion to correct slight degrees of ametropia for the relief of asthenopic symptoms in school children. But many of these children, after leaving school, if in perfect health, can discontinue the use of their glasses without suffering any inconvenience or discomfort, though their refraction errors have remained unchanged; which only goes to prove that the nerve forces of a normal young adult are abundantly able to meet the special demands of moderate degrees of ametropia without the least disturbance of their equilibrium.

Whenever, therefore, a healthy young adult complains of discomfort in using his eyes and upon searching inquiry no evidence can be obtained, that during school life he had suffered from eyepains or headaches, I think we should not accept an existing slight ametropia as the cause of his discomfort unless the most scrutinizing examination fails to detect any other, local or general, condition which might account for the apparent asthenopia.

While I do not for a moment countenance the practice in

vogue in many large dispensaries, especially in Europe, where patient after patient with aching eyes is dismissed after a casual examination as a case of conjunctivitis, because the eyes are red and watery, when a careful examination of refraction would show that glasses are needed, I maintain, on the other hand, that in many instances, like in the case I mentioned as an introduction to this address, glasses are prescribed where the patient's complaints are not caused by the existing ametropia, but are due to pathologic conditions of the conjunctiva which are overlooked. In making this statement I do not intend to cast any reflection upon the carefulness and ability of the attending oculist. I know my confrères are as painstaking in their examinations and as able as I am to tell conjunctival changes when they see them; and if, under certain conditions, I see them where they do not, it is not because they are less careful in their examination or less competent, but because we pursue different methods in the examination of the lids.

The prevailing method of examining the conjunctiva is first to expose the conjunctiva of the lower lid by drawing it down and away from the eyeball, and then to evert the upper lid to inspect its conjunctival surface. If the conjunctiva thus exposed appears normal, the examiner comes to the conclusion that, nothing being wrong with the lids, the discomfort of the patient in near work must be due to the present error of refraction and that glasses must be prescribed.

But does the simple eversion of the upper lid expose the whole expanse of conjunctiva? Or does it not conceal from our view the retrotarsal fold? And is not this fold sometimes the seat of marked pathologic changes, while the palpebral conjunctiva may present a normal condition? The examination of the lids, therefore, cannot be said to be complete unless it includes the inspection of the retrotarsal folds of the upper lids; and they can be exposed to our view very easily by the following procedure: While the free border of the everted upper lid is firmly pressed by the thumb or index finger of the left hand against the supraorbital margin, the forefinger of the right hand placed upon the lower lid pushes the latter upward until it pretty well covers the cornea, when a gentle but steady pressure is made upon the globe as if to

push it backwards into the orbit; a slight back pressure of this kind is sufficient to make the retrotarsal fold come down from behind the everted lid. The whole manipulation is easy and gentle, harmless and painless, and it can safely be used with the exception of cases of deep and extensive corneal ulcers. I have tested its practical value in a great many cases, but hardly ever with more telling effect than in the following instance: About ten years ago a physician who was taking post-graduate courses in this city consulted me about his eyes. He had been seriously handicapped in his studies because he could not read up at night about what he had seen in the clinics during the day, because his eyes began to ache and his lids to droop after reading half an hour. He had consulted the professor of his school, who first prescribed reading glasses for a slight hypermetropia; and when the glasses (+ 1D) failed to bring the expected relief, he advised an operation for ptosis. It was in regard to the advisability of this operation that the doctor wished to obtain my opinion. When I examined the lids in the usual way the visible conjunctiva showed nothing abnormal; but my back pressure method at once revealed the retrotarsal folds thickly studded with follicular bodies. I of course had to advise against the proposed operation; and after the follicles had been removed by expression and the eyes were treated with boric acid for ten days, the doctor could take up his studies and enjoy reading for hours with comfort though he did not use his glasses. He assured me the other oculist had repeatedly everted the lids for examination, and wondered why he did not see the follicular condition of the folds.

You will now understand why he failed; you will also fully appreciate the force of my advice that in healthy young adults, especially if they have not suffered from asthenopic complaints during school life, we should always make a most searching examination of the conjunctiva before we suspect a slight refraction error as the cause of the patient's complaints; because failure of detecting present pathologic conditions of the conjunctiva leads to misunderstanding the etiology of the complaints and to prescribing glasses which are no benefit to the patient and therefore superfluous.

Another class of patients who not infrequently are the

victims of superfluous glasses are the sufferers of blepharitis. This inflammation of the lid margins, no matter how slight, is always attended by more or less hyperæmia of the conjunctiva; and owing to this hyperæmia blepharitic eyes are exceedingly sensitive and irritable, easily disposed to become red, watery and painful. These symptoms are particularly likely to develop during prolonged near work, so that blepharitic persons applying themselves to close work (bookkeepers, stenographers, students, seamstresses) are usually complaining of blurring of vision, painful eyes, and often even of headache. In many of these cases the scales along the lid borders are like fine dust and easily overlooked; the patient's complaints are taken for accommodative asthenopia and treated with glasses. Now if such persons have faithfully used their glasses for a year or two without benefit, if then they are relieved of their complaints in a week or two by the proper treatment of the blepharitis and thereafter continue their work with perfect comfort though they do not use glasses, we are forced to the conclusion that the glasses were unnecessary. No other conclusion seems to be permissible in cases like these:

1. January 21, 1900, Mr. J. F. E., 25 years old, bookkeeper for four years; can work over his books several hours in the morning with comparative comfort; toward noon, however, his eyes get red, watery and burning, and in the afternoon a dull headache often compels him to interrupt his work. During the past year he has been treated with various eye waters and has worn glasses (R.E. + .50 cyl. ax. 100°; L.E. + .25 cyl. ax. 70°), but without any benefit. Lid edges slightly red and covered with fine scales like dust. R.E. $^{20}/_{15}$, with + .50 cyl. ax. 180°; L.E. $^{20}/_{15}$, blurred by + 25 sph. or cyl. Lids were treated with ichthyol ointment; glasses discarded.

January 31. Noticed improvement after two treatments; now lids well and he can do a full day's work without the slightest inconvenience.

2. Miss C., 19 years old, came to me last November. For 4-5 years eyes smarting, burning and watering. During the past two years wearing glasses (.25 cyl. ax. 90°); nothing was ever done to her lids. Lid edges very red and

thickly coated by soft epidermis scales. Under homatropine each eye V. $^{20}/_{15}$, with + .25 cyl. ax. 90°. Glasses were discarded; lids treated with arg. nitr. and ichthyol ointment; and in two weeks the blepharitis was cured and she could resume her work as dressmaker without further inconvenience.

In the second case the blepharitis was so marked that it could not have been overlooked by the attending oculist, and the fact that he paid no attention to it makes me suspect he believed in the false doctrine that refraction errors are the cause of blepharitis and their correction by glasses cures the lid trouble.

The relation of ametropia to blepharitis was first brought to our notice by Dr. Roosa of New York in a very interesting paper read before the International Ophthalmological Congress in New York in 1876. He summed up his observations in these sentences: Ametropia seems to be the condition of most eyes affected with blepharitis ciliaris. Hypermetropia is the error of refraction most frequently associated with blepharitis ciliaris, and when blepharitis is associated with errors of refraction the cure of the edge of the lid is very much facilitated by and sometimes depends upon the correction of the ametropia.

You will observe Roosa claimed neither that ametropia causes blepharitis nor that correcting glasses alone would cure it. What he maintained was that an existing blepharitis (like an existing conjunctivitis) may be aggravated and our treatment may be interfered with by the adverse influence of existing ametropia. The practical conclusion to be drawn from these observations is that the refraction of blepharitic patients should always be examined, and in refractory cases the ametropia should be corrected, because it is very probable that in such cases eyestrain frustrates our therapeutic efforts, and that the removal of this obnoxious influence will greatly aid the local treatment of the lids.

Dr. Keyser, however, writing on the same subject one year after Roosa, expressed the belief that ametropia was in many if not in all cases the direct cause of blepharitis; and although Roosa's report showed that in the great majority of his cases the hypermetropia was of a low degree (one dioptry and less), we find in one of the most widely-circulated modern

text-books this statement: "The usual presence of considerable degrees of ametropia has led to the belief that this causes blepharitis" (Roosa). And this statement is followed by the advice that "in all cases the refraction should be ascertained and any anomalous condition corrected by suitable glasses."

Thus the impression is created that the chief, if not only, service to be rendered to blepharitic patients is the prescription of glasses; and as with our present tests we can easily find an ametropia of a quarter or half dioptry in almost every eye, physicians can always find an excuse for prescribing glasses to blepharitic patients; but if they keep track of these patients they will also find that these weak lenses usually are of no value, because the additional accommodative work imposed on the eyes by these low grades of ametropia is too trifling to create so much local disturbance as is manifested by the inflammation of the lid margins.

Mr. President: Lest my remarks be misunderstood, I wish to state I do not belong to those who consider the correction of low degrees of ametropia as superfluous under all circumstances. On the contrary I have long ago convinced myself that weak lenses have their sphere of usefulness, and (in 1894) I have written a paper in their defense, from which I will quote the following passage which clearly defines my position: "In the light of these clinical proofs it must be conceded that these weak cylinders are not superfluous glasses; that their therapeutic value is not mythical, but real; and that the oculist will render his patients a great service by prescribing these weak glasses whenever in his judgment he has reason to believe that the existing low degree of ametropia is the source of the patient's distress."

We must not forget that the eye is most successful in correcting by accommodative efforts the optical disturbances produced by slight degrees of hypermetropia or astigmatism, while in the higher degrees of these refractive errors it does not succeed, and therefore abandons the efforts. The moderate degrees, therefore, are the prevailing errors of refraction found in patients complaining of the symptoms of eyestrain.

The degree of ametropia does not constitute the principal

condition in the production of distressing symptoms; and experience does not sustain the statement that hypermetropia or astigmatism less than 0.75D seldom causes discomfort or headaches. The state of health, the condition of the nervous system, the occupation are very important factors, and frequently account for the fact that in many persons a slight hypermetropia or astigmatism causes great distress, while other persons never experience the slightest discomfort from the same ametropia in kind and degree.

Many eyes can endure a great amount of strain with impunity, while other eyes are so constituted that their powers of endurance are quickly exhausted. One person may need glasses for the correction of a small amount of ametropia, while in another person the correction of a much higher degree is unnecessary and glasses would be superfluous. We cannot draw the line at a certain amount of ametropia; but should correct it, no matter how slight in degree, whenever it leads to disturbances for which eyestrain constitutes a frequent cause.

To be sure, I am not prejudiced at all against weak lenses; I do not oppose the correction of ametropia because it is of an insignificant degree; but I do object to the indiscriminate prescribing of glasses.

Glasses are no ornament; they do not improve the personal appearance or the facial expression; they are a nuisance at best, and therefore should not be inflicted upon patients unless we have good and sufficient reason to believe their complaints are caused by the existing ametropia.

Refraction work has become a very prominent and important part of our practice; it is done with more care and greater accuracy in this country than anywhere in the world, and has achieved many brilliant and often unlooked-for triumphs. But, dazzled by these brilliant achievements, some oculists seem to have gone refraction-mad; they attribute every discomfort in the use of the eyes to eyestrain; they fairly hunt for refraction errors and imagine they are doing scientific work if they prescribe glasses for any degree of ametropia they can detect.

What absurd consequences this one-sided tendency may sometimes lead to I will illustrate by the following two instances:

1. In January, a lady from Iowa, 44 years old, consulted me on account of asthenopia. For more than ten years she had been unable to read because her eyes began to ache after a short attempt. She was a confirmed neurasthenic; her eyes showed no disease: V. of R.E. $^{20}/_{200}$, with — 4 cyl. ax. 15°=$^{20}/_{70}$; L.E. $^{20}/_{20}$: with + 1.50 smallest print very distinct; but after reading fifteen minutes pain compelled her to stop, even if the right eye had been closed all the time. This woman had been constantly wearing glasses (R.E. — 5 cyl. ax. 180°; L.E. + .50 D.) the past ten years, which were given her by an experienced oculist in this city. Now was it reasonable to expect any good result from the correction of the anisometropy in this case? The sight of the uncorrected right eye is so poor that the woman depends for seeing entirely on her left eye: and the kind and degree of the ametropia certainly make it impossible to better the vision by any spontaneous effort of the ciliary muscle. Hence eyestrain is evidently not the cause of the woman's trouble, and therefore the correction of the astigmatism of the R.E. of no use. But suppose the correction would make the vision of the R.E. fairly good ($^{30}/_{40}$ or $^{20}/_{30}$), would it be likely to relieve her trouble? I think not: on the contrary I believe it would increase her misery by adding all the distress of hyperphoria to her old troubles. For the concave cylinder with horizontal axis acts like a vertical prism as soon as the visual line passes below or above the plane of the cylinder axis; and Dr. Jackson showed (*Ophthalmic Record*, Jan., 1902) that the prismatic effect of a 4 D. lens amounts to one degree for every 2.3 mm. decentration. For obvious reasons the line of vision cannot remain in the plane of the cylinder axis in all the acts of looking; in reading, for instance, it will necessarily pass 2, 3 or 4 mm. below this line. And as this is equivalent to decentering the cylinder, it is clear the —4 cyl. would necessarily cause a distressing vertical diplopia.

2. A gentleman from Michigan, 42 years old, has tried for twenty years to obtain relief from headaches and eye pains. He has had various glasses; the last pair (R.E—1.50 cyl. ax. 180°; L.E.+1.25 cyl. ax. 180°) made him so dizzy and nervous that he could not wear them five minutes. I found R.E.V. $^{20}/_{30}$ with —4⌒—1.50 cyl. ax 180°; L.E.V. $^{20}/_{20}$

with $+50\bigcirc+1.25$ cyl. ax. 180°. But with these compound lenses, as well as with the cylinders alone, he had vertical diplopia, the images separating perceptibly under the slightest movement of the eyes upward or downward. When a red glass was put before the right eye, and the patient looked down, the red image was the upper one, and when he looked up the red image was the lower one. We can easily account for these phenomena; for the lower half of the concave cylinder of the right eye acted like a prism, base down, and its upper half like a prism, base up, while the lower half of the convex cylinder of the left eye acted like a prism, base up, and the upper half like a prism, base down. Hence the prismatic effect of both cylinders acting in opposite directions increased the vertical displacement of the images, and it was a physical impossibility for the patient to wear glasses which corrected, in part or in whole, the refraction errors of both eyes; and it showed a lack of good common sense to prescribe such glasses.

It was Huxley, I believe, who once said, "Science is nothing but trained and organized common sense." This definition, I think, applies with particular force to a practical science like ours. A good dose of common sense should always guide us in our work; it will save us from becoming dogmatic and one-sided; it will make us treat our patients not as mere scientific problems, but as human beings anxious to be relieved of their troubles; it will make us cast theories to the winds and consider only real conditions; and, among other things, it will sometimes, perhaps many times, guard against the misuse of glasses.

TOXIC AMBLYOPIA.*

BY DUDLEY S. REYNOLDS, A.M., M.D.,

LOUISVILLE, KY.

IT is not my purpose to discuss the subject of toxic amblyopia beyond the limits of personal experience, which I regret to say is not entirely in accordance with text-book authority.

I have chosen for purposes of illustration a case of nearly total blindness, the result of drinking essence of cinnamon; a typical case of autotoxæmia; and four cases of tobacco amblyopia in persons who have never taken alcohol.

CASE I.—J. H. P. of Morgan County, Ky., was brought to me on the 21st of November, 1901, by Dr. B. F. Carter, with the statement that, on the night of August 5, 1901, the patient, in company with two other persons, indulged in a debauch, each of them drinking about twelve bottles of essence of cinnamon, the bottles containing near three ounces, amounting in all to more than one pint of the essence. Dr. C. was called next morning, August 6th, and found all three of the persons in profound stupor, with dilated pupils and stertorous breathing. The other two died without recovering consciousness, one during the night of the 6th, the other at noon on the 7th. P. vomited during the entire night of the 6th and all day of the 7th of August. He had a temperature of 105° F.; pulse 150, difficult to count; breathing so irregular it was not counted.

He remained in bed for three weeks, having at times short intervals of consciousness, during which he complained of being entirely blind. During all this time he occasionally vomited bloody mucous and small quantities of green bile. He complained constantly of pain in the head, with cramping in the stomach and legs. With gradual recovery of general health his sight did not improve.

On the 21st of November I found him with nearly obliterated retinal arteries, large veins, extremely pale, ashy-colored discs, with steamy opacity extending into the retina (Fig. 1). His field of perception of white, on a black background, was extremely narrow, and limited to the nasal side

*Read to the Western Ophthalmologic and Oto-Laryngologic Association, Chicago, April 12, 1902.

in the right eye. Under favorable light he counted fingers at 11 inches distant. He could not distinguish any of Snellen's test type. The left eye had a much wider field of perception, lying chiefly to the nasal side of the disc. He could count fingers in a favorable light at 4 feet 9 inches, but, singularly enough, he was unable to distinguish any of the test type at any distance. His capacity for recognizing form of objects seemed totally obliterated. For example, he could not recognize my hand with the right eye excepting as a dark object. He could distinguish one finger, but could not distinguish two; the shadow seemed larger when more fingers were raised.

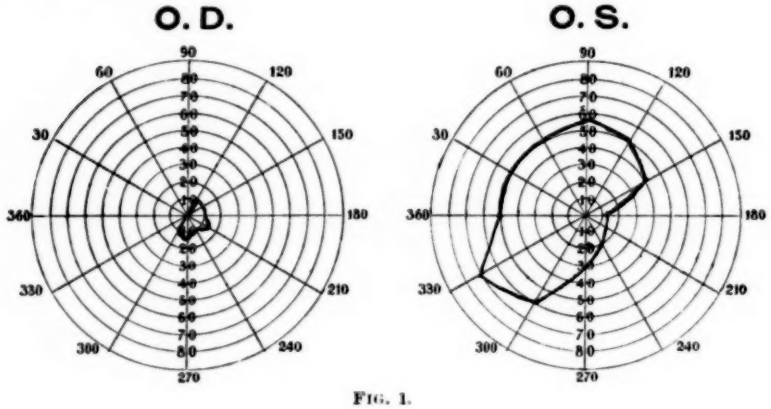

FIG. 1.

Just how much importance to attribute to the cinnamon, and how much to the alcohol, is difficult to determine.

The pupils were sluggish, about 3 millimeters in diameter, and responded imperfectly to homatropin. There were apparently no disturbances in the movements of the ocular muscles. He had not been in the habit of taking liquors, and had never used tobacco.

The history of acute alcoholic poisoning does not show such permanent and disastrous results. The blotting out of the temporal side of the field in the right eye, and the almost entire extinction of it in the left, would be difficult to explain. The irregularity of peripheral contraction of the field is likewise not common to alcoholic poisoning. I am constrained to believe that the cinnamon was in this case the chief toxic agent.

From Dr. Carter's notes, and my own examination of the patient, it is quite impossible to know if central scotoma existed at any time. Surely nothing of the kind could be disclosed in my examination. Of course, he has no color perception. Strychnine has proved unavailing. The evidences of extensive neuro-retinitis are distinct.

Case II.—Mrs. E., aged 30, Giles County, Tennessee, came to consult me about her eyes, May 31st, 1900. She had been under the treatment of several eminent specialists for optic neuritis. She could distinguish with the right eye $^{6}/_{60}$ Snellen, and with the left eye none of the test type at any distance. Perimetry showed large central incomplete

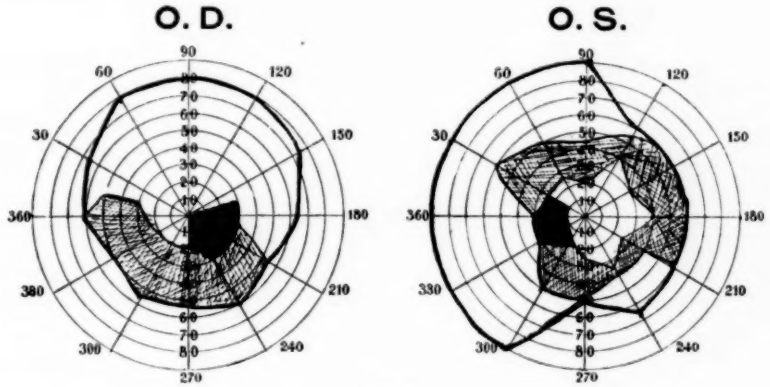

Fig. 2.

scotoma in the left eye, and smaller incomplete scotoma in the right eye. Ophthalmoscopic examination disclosed hyperæmia of both discs, without other abnormal appearances.

She was pale, thin, with feeble pulse, mottled complexion. She suffered with a sense of oppression on eating; had no appetite; and could not remember when her bowels moved without taking medicine. She did not drink water, and had recently abandoned coffee and tea on account of indigestion. She had been recommended to adopt the milk diet, but had been unable to do so. She was exceedingly feeble, and suffered with insomnia.

Twelve ounces of citrate of magnesia failing to produce any result, a grain of calomel, with one-half grain each of podophyllin and aloin, cleared the alimentary tract. She

afterwards took one-half ounce of phosphate of sodium in one pint of water on arising in the morning. She was denied solid food, and required to take one-half pint of fluid nourishment every two hours during the day, followed by 5 minims of tincture of nux vomica in one-half pint of water at each dose. She was required to have a plunge bath every morning and every evening, and an occasional dose of quinine, 10 grains, at night. At first she could not sleep, and was required to take a quart of malted milk, warm, at 9 P.M. This promptly relieved the insomnia, and she went on improving until June 28th, when, after correcting hypermetropic refraction, she read $^{6}/_{9}+$ with the right eye and $^{6}/_{18}$ with the

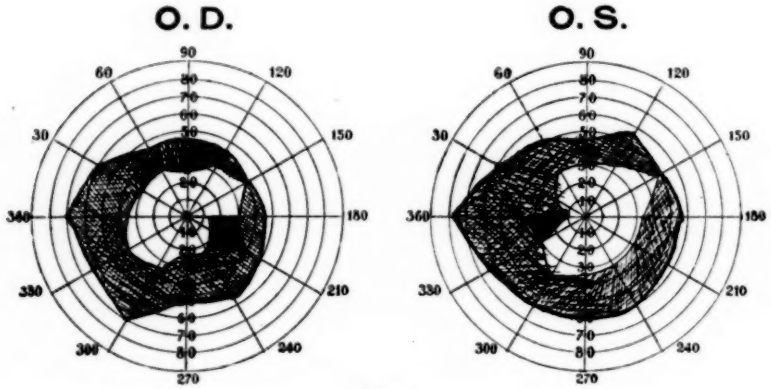

FIG. 3.

left. She continued to improve until full restoration of normal acuity of perception exists in both eyes. She is in robust health, having gained more than fifty pounds in weight, and enjoys perfectly comfortable vision.

I have many similar experiences, and select this as the best representative of a large class of patients, mostly women.

CASE III.—March 3, 1900, B. C. L., aged 46. A fine, robust-looking man; a traveling salesman. He came to me to see about getting glasses with which to read. Careful testing showed that, with + 0.25c 90°. Sight = $^{6}/_{18}$ in the right eye, and with the same correction, sight = $^{6}/_{12}$ in the left eye. Ophthalmoscopic examination showed pale discs only. Perimetry disclosed ring-scotoma, incomplete in the right eye; complete in the left, with peripheral contraction

in both fields, with remarkably enlarged and irregular blind spots corresponding to the discs (Fig. 2).

Mr. L. had no bad habits excepting that he smoked almost continuously. The nature of his amblyopia being explained to him, he at once abandoned tobacco, and was given pills of assafœtida and nux vomica (¼ grain to 3 grains), one pill to be taken before each meal and at bedtime. On the 6th of April re-examination showed slight improvement in visual acuity in the right eye, while vision in the left rose to $^6/_6$. Further improvement has resulted until he now sees $^6/_9$ Snellen with the right eye.

Case IV.—June 15, 1900, J. R. P., aged 27. Insurance agent. Complained of indistinct vision in reading, and of

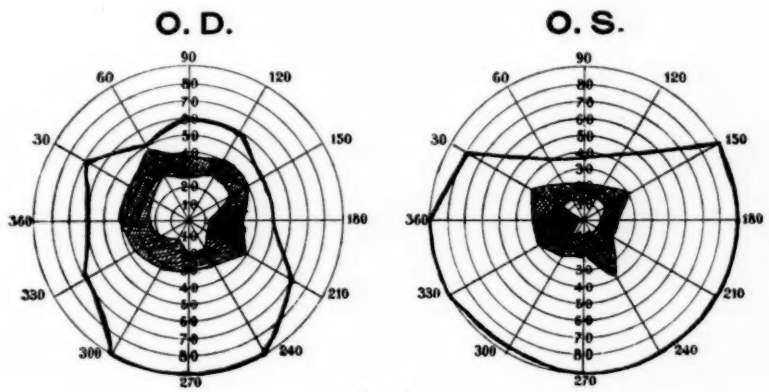

Fig. 4.

great difficulty in adding up columns of figures. Under cycloplegia I found hyperopic astigmatism in both eyes, correcting which he saw $^6/_6+$ with the right eye and $^6/_6-$ with the left. A fine film of smoky haziness seemed to hover around the center of objects looked at. In looking at a long word he could not see the whole word distinctly at one time. The field in both eyes, as shown in Fig. 3, shows great contraction of the periphery. Incomplete scotoma surrounded the central field. The blind spots corresponding to the papillæ were enormously enlarged and of irregular outline. The ophthalmoscope showed pale discs only.

He had been an habitual cigarette smoker for the past ten years. Had never used alcoholics, nor tobacco in any other

form. Abandoning the habit gave him little or no trouble, and his field, he thinks, has entirely cleared up, though I have not had the opportunity of re-examining it.

Case V.—J. J. E., aged 29. Train dispatcher. June 19, 1901. Had indistinct vision, with difficulty in reading at night. Testing refraction showed emmetropia, with sight $=^{6}/_{12}$ in the right eye, and $^{6}/_{18}$ in the left. (Fig. 4.) Peripheral contraction of the field in the right eye was much greater than in the left. Incomplete ring-scotoma exists in both eyes, completely encircling the center of the field. He was an habitual smoker, but had never used liquors of any kind. Abandoning tobacco has, without the aid of drugs, entirely

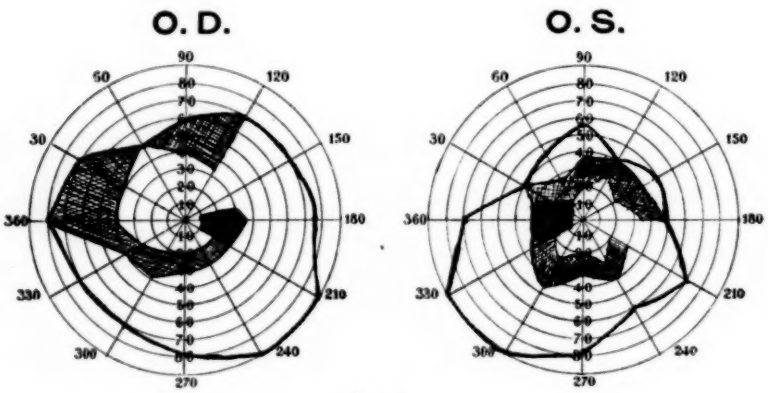

Fig. 5.

relieved the right eye, and he has nearly normal acuity of vision in the left eye, after a lapse of six weeks.

Case VI.—C. A. W., aged 26. Clerk in Adams Express office. January 3, 1902. In good general health, had never used alcoholics. He had noticed for the past six months a gradually increasing film near the center of his field of vision, which greatly annoyed him, especially at night. (Fig. 5). He had normal acuity of vision in each eye, with irregular peripheral contraction of the field, and incomplete ring-scotoma. He abandoned tobacco, and in two months has entirely recovered.

In Cases V. and VI. it will be observed that the same abnormal conditions of the papillæ were observed. There were no ophthalmoscopic signs.

BLEACHING OR DISTINCT PALLOR OF THE TEMPORAL SEGMENT OR PAPILLO-MACULAR BUNDLE OF OPTIC NERVE FIBERS DUE TO OTHER CAUSES THAN TOBACCO AND ALCOHOL.*

By J. O. STILLSON, M.D.,

INDIANAPOLIS, IND.

IN an article on Toxic Amblyopia†, published in the *Ophthalmic Record*, October, 1899, the writer of this paper made mention of the fact that a certain class of cases may be found wherein the functional signs and objective symptoms so closely resemble that disease that one would sometimes be justifiable in disputing the word of honor of an otherwise worthy patient, and charging to the account of some vicious habit the resulting decrease of visual acuity, instead of searching for the cause in the physical rather than in the moral make-up of the patient.

In the same paper referred to‡ "Some of these cases presented well-pronounced pallor of the nerve head on the side next to the macula lutea, and a few among women resembled markedly, but had to be excluded from tobacco blindness, because of the known absence of this factor, the writer being convinced at that time that this disease is far more prevalent than has heretofore been held, and that functional disturbances of vision, in one or both eyes, may be due to the introduction into the circulation of toxic agents other than tobacco and alcohol: that the two great agents, whisky and tobacco, substances which produce at all times more or less disturbance in the general circulation, while they have been accredited with this malady either together or alone, yet are not wholly to blame, but other agents may be found which will produce like conditions, temporarily, and even permanently, and that some of our best observers, notably Wood, Sachs, De Schweinitz, Knapp and others, have met with cases due to various drugs, e.g., lead in painters, stramonium, which is found in asthma cigarettes, quinine in excessive doses, etc.,

*Read at the meeting of the Western Ophthalmologic and Oto-Laryngologic Association, held at Chicago, April 10, 11 and 12, 1902.

†Ophthalmic Record, October, 1899. Vol. VIII., page 502.

‡Loc. cit., 502, et sq.

etc., *and that it is highly probable that certain elements existing in the system under certain depraved conditions produce auto-intoxication (diabetes, lithiasis, sepsis, etc.), as well as certain chemical combinations occurring in the stomach or intestines under analogous conditions, either alone or combined with elements of tissue waste, must be recognized as factors in bringing about disturbances in the visual fields, and that optic nerve changes may occur characteristic of this condition, both in the acute and chronic form.*"

In the following autumn a case came under the observation of the writer which presented some peculiar features not before seen. It had had every feature objectively of retrobulbar toxic amblyopia, with none of the elements of history justifying this diagnosis other than the subjective symptoms peculiar to diminished visual acuity, scotomata, and pallor of the temporal zones, and, so far as could be seen, fairly good circulation in the retinal vessels, and otherwise normal fundi.

Miss Kate M., nurse, aged 35, slightly anæmic, neurasthenic, but otherwise uncomplaining as to general health, menstrual functions not disturbed, has for the past two years been engaged in nursing an aged lady, who is quite feeble and a great care and task on her strength. This was in the autumn of 1899. Prior to last year she was able, notwithstanding the feebleness of her charge, to get regular sleep at night and sufficient exercise during the day in the open air, to enable her to nurse this case alone and administer to her ever-increasing demands for attention. But for the past year sleep at night has been obtained with difficulty and often not at all. Her vigils had to be alternated between day and night, most of the time during the whole night, at which times she was relieved during the day by some member of the patient's family. Her sleep during this time has usually been obtained during the forenoon, and with one or two hours relaxation in the open air during the afternoons she has been compelled to resume her duties upon the approach of evening and continue the same throughout the night. Much of the time at night has been spent reading. On account of her gradual failure of sight which has been noticed for the last four or five months, she was of the opinion that her refraction required correction, and was

surprised to find that glasses did not at once relieve the difficulty. Upon ophthalmoscopic examination the temporal sides of both optic nerve disks showed well-marked pallor: this condition was somewhat more marked in the right eye than in the left. The perimeter showed central scotomata for colors red and green, and there was symmetrical contraction of both fields for form. At once the suspicion was aroused that she might be in the habit of taking some form of narcotic or hypnotic, and every effort was made to find out what this might be. She, however, persisted that such could not be the case, and as she was a very sensible woman of undoubted veracity, and as she was familiar with the action of drugs, having had ten years or more experience as a trained nurse, this had to be excluded. No alcoholism could for a moment be entertained, and of course no tobacco history. At first I was led to hope that it might turn out to be hysterical in origin, but this had to be also abandoned for the reason that she showed no signs of anything of the kind. There were in her make up, however, the indications of a run down condition of health which I finally attributed to her work. She was put upon treatment, ordered baths and given alterative doses of sodium iodide, with an occasional saline, but this treatment made but little effect on her visual trouble. This went on for several months. During the winter she disappeared from observation, but returned in the spring in practically the same condition as before except possibly slight decrease in visual acuity. Soon after this her patient died, and she went on a short vacation expecting to return and resume her eye treatment. But I did not see her as soon as expected. Some months later she returned, and reported that after her vacation, she had undergone an operation for appendicitis at the hands of a very reliable and trustworthy surgeon, who reported to her that he had found a pus cavity, the size of which I did not learn, and that he had removed it with the appendix. She spent some six weeks in the hospital and made a good recovery from this trouble and had now resumed her normal habits of sleep at the house of the family where she had been employed as a nurse, and where she was urged to remain until she should fully regain her

health and sight. The treatment was now resumed for her eye trouble and she was given pilocarpine and strychnine, the latter in gradually increasing dosage until it was carried to the point of toleration. A dark room was advised, and her exercise which consisted in walking and massage was obtained at night. One thing I had observed about the pupils, that they had from the beginning been rather large and the pupillary reflexes were sluggish. Eserine was occasionally used in the eyes to produce myosis, and all attempts to use the eyes prohibited. This was kept up for something like six weeks. At the end of that time she began to improve in sight and the pupils no longer required a myotic, but resumed their former activity and reaction to light. During the course of this last treatment she alternated at times in her habits of sleep; for a week or so her sleep would be obtained entirely in the day time, and she would remain wakeful throughout the night; the next week she would switch around and sleep entirely at night. To avoid the unpleasantness of night wakefulness I allowed her to have company during the days and gave her medicines at this time, following it up at times with bromides in the evening, and in this way finally obtained good restful nights and cheerful days. The perimeter now began to show some improvement in the fields; the concentric contractions widened for form and the central scotomata faded, but the appearance of the papillo-macular segments was the last to return to normal. In fact the last time I saw her I thought they still looked pale though greatly improved. This patient went on to what she seemed to believe was a complete recovery. A year after this experience I met her one day in the city, and she reported that she was now entirely well. Her refraction had been corrected, at the first interview long before the operation on the appendix, and she was using the same glasses which were satisfactory to her.

I report this case because it was very puzzling to me at the time, and I do not now know what was the matter unless it might have been toxicity due to sepsis. I ought to say that her constipation, from which she had suffered before the operation, disappeared, and the functions all resumed their natural order. Whether this could partly be attributed to the

strychnia or not, I am unable to say. Doubtless the prolonged rest after the two years of strain and worry had much to do with the cure. As to the pallor of the nerve heads and their gradual recovery, I have also no other explanation to offer, but of the facts as stated above in the history of the case I am quite sure.

I observed the same phenomena in another case about a year ago, in the person of a young lady who was a very ambitious college girl. She was run down in health and strength, and on her way home for rest I learned from her that her brother had been treated by a very reliable and eminent oculist of Washington for tobacco amblyopia, and that he had recovered upon the cessation of the use of the weed, but as in her case there could be no tobacco nor alcohol, I was led to believe that we might both of us be mistaken by a physiological pallor common to two people in the same family, and that there might be some hereditary neurosis at the bottom of these cases, and I was quite anxious to have her return for further observation later, but she had not yet done so. She was a sufferer from chronic constipation. In this case the trouble was also bilateral, both nerves looking pale.

In this connection, it seems to the writer, that it would not be out of place to ask the question what, in the opinion of those present, constitutes physiological pallor, and what we understand to be the dividing line between physiological and pathological pallor. In other words, how does the normal nerve head look to different observers, and how will each of us describe in intelligent language just what he sees when he finds what to him seems to be a departure from the so-called normal papilla, so far as coloration is concerned? I remember once to have heard a discussion along this line as to the apparent size of the papilla. I remember what a difference there seemed to be among different able observers on this point, and how utterly at variance the descriptions seemed to be. One likened the papilla in size to a three-dollar gold piece. Now this is a coin which is to-day quite rare; in fact, but few have seen such a coin. We all have doubtless seen the two-and-a-half dollar gold piece. To me this coin looks larger than the optic papilla. In that discussion

another said that it looked to him the size of a three cent silver piece; another thought it was the size of a dime; another the size of a copper cent, and one even said it looked to him as large as a quarter. We all readily understand the difference between the upright and inverted image so far as size or apparent size of the papilla is concerned, as well as the different degrees of "grossisment" or enlargement caused by the apparent magnification in myopic eyes: yet still notwithstanding allowances made for this reason, we find in looking over the different atlasses a wide dissimilarity in reference not only to the coloration but as to the size of the papilla by different authors. Take for instance the now classic work of Liebreich. Consult his Table II. where he gives the upright image in normal eyes of brunette, blonde and African. To me the papillà of the eye of the brunette looks the same size as a nickle, which is larger than I think I ever saw it in the upright image in health, and it is as white to me as absolute white optic nerve atrophy ever looks. On the other hand the papilla of the blonde eye is to me the size of a silver dime, and considerably whiter than it should be, having also a mixture of atrophic gray which we see in tobacco amblyopia frequently. Turning now to the same plates in Table IV. of Jæger's Atlas we find that he attempts to give the same idea to the observer by a set of plates which, while they are a marvel of beauty, still lack something to make them appear natural. To me these plates both of the eye of a light complected, and of a brunette eye have the temporal segment fully as ashen as I have seen it many times in tobacco amblyopia.

On the other hand we have to remember that age has a good deal to do with the appearance of the papilla in health. Take, for example, the papilla of very aged people. We often see the papilla dirty ashen while there is present good vision. No longer than a week ago I had a similar experience in the person of a lady 73 years old, highly presbyopic, where not only were both nerve heads very, very white, so much so that when I first looked at the eye in which she thought the sight was decreasing, I could hardly refrain from declaring at once that the nerve was atrophic; and yet upon testing the vision after correcting the refraction I found

quite good sight. In this case the arteries were quite small, even threadlike, and I could see the interstitial connective tissue of fibers between the nerve fibers of the papilla, apparently in the state of well-marked sclerosis. In the other eye I found a similar condition, yet not so well-marked. I was quite glad I had been cautious and deliberate about a diagnosis until after the refraction was looked into, for I should have pronounced such an eye hopelessly blind upon the ophthalmoscopic appearances alone, whereas the sight was good in both eyes.

During the past five years I have taken occasion to study the appearance of the papilla in as many cases as excuse or opportunity would permit, and have been frequently astonished at the variety and dissimilarity of different optic nerves as to coloration, in eyes apparently healthy, and the more I see of this matter the more I am convinced that much remains yet to be learned in this field. Whether we see what we think we see, or what we really see, is a matter not always easy to determine. The intensity of the illumination has much to do with deception sometimes as to colors. I well remember Jaeger used to insist that his large, clumsy, unsilvered mirror was even better than the plane mirror in the upright image, especially if retinitis were present, and I have no doubt in my mind that many of the cases reported anomalous are really eyes that look to some extent deceptive on account of too great or too bright illumination, and I am convinced from experience that causes apart from alcohol and tobacco often produce passing changes in the papillo-macular bundle, whereby it shows paler at one time than at another.

DISCUSSION.

Dr. Brunson, Hot Springs.—I am surprised at Dr. Reynolds, being from Kentucky and not being able to differentiate between good and bad whiskey. I am sure I have read of a number of cases in which drinking the essence of ginger and one case in which the essence of cinnamon has caused amblyopia, and in every case it was found that the essence was made of wood alcohol instead of pure alcohol. The symptoms related by the doctor have been present in all the cases of this kind of amblyopia.

Drinking wood alcohol alone will bring about these symptoms —inhaling it, even. I saw one case of a negro woman accustomed to going on periodical sprees. She went to a drug store and asked for alcohol. The druggist, not knowing what she wanted with it, gave her the ordinary Columbian spirits or wood alcohol. She took this home and in four hours she was dead. So the wood alcohol was undoubtedly the cause.

Dr. H. V. Würdemann, Milwaukee, Wis.—I agree with the doctor and would think the cause of sudden and complete blindness in Dr. Reynolds' first case was due to ingestion of methylic alcohol. I have seen several of these cases and have been "in at the death" of one case of blindness and supervening death in 24 hours from the inhalation of Columbian spirits used in shellacking the inside of beer vats, and I have also seen another case, and there are two at present in Chicago, one of which I have seen, in which total blindness was first produced by the inhalation of methylic alcohol in the same manner. One man became entirely blind, and the case I saw became so blind he was unable to work: vision reduced to the counting of fingers at 2 m. In all of the cases reported, the first one by Wood, those by Gifford and by Brunson and others, of the ingestion of the essence of Jamaica ginger and the essence of lemon, of plain wood alcohol in the first two cases reported from France, of the drinking of plain varnish in a prison in France, there was complete blindness, followed later by vomiting, then coma. Gifford reported a case of complete blindness which is still alive, and if I remember right, two deaths. That shows the effect of methylic alcohol in persons predisposed towards poisoning by it; everyone is not poisoned by large or small doses of certain drugs. I know that men in the north part of Wisconsin and Minnesota, the Swedes and Indians, too, drink pure alcohol, and I know of their drinking red ink and the various essences which have been recently adulterated by using methylic alcohol, and it has no effect; but in persons predisposed towards poisoning by these drugs, the symptoms result the same as reported by Dr. Reynolds. Methylic alcohol produces sudden and complete blindness, followed by vomiting, eventually by coma. There are a great many

causes for amblyopia, and I have seen toxic amblyopia from the ingestion of ordinary wine. They, however, have tended towards complete recovery.

Dr. Jackson, Denver.—I think the poisoning by methylic alcohol is so definite and characteristic in its symptoms that we are just as much justified in making a diagnosis as we would be in cases of small-pox or measles. I think we can say definitely that this was a case of blindness from wood alcohol poisoning, and I think there can be no question of the nature of Dr. Reynold's case. The first of these cases was reported by Dr. Thompson of Philadelphia. It was produced by Jamaica ginger. We find the people are quite given to the use of Jamaica ginger in prohibition districts, but I did not expect that in Kentucky: but wherever and under whatever circumstances, I think there can be no question about these cases. The early or immediate recognition of the cause is of practical importance, because soon all of these cases have gone on to complete blindness. I have seen one case of absolute blindness in one eye and nearly so in the other. And yet there are a few cases, one by Hunt and one by Stein, that have made a complete recovery, and it is quite possible that a considerable proportion can be brought to good recovery if they are seen and treated early along the proper lines. Such recovery is something entirely different from the apparent recovery that has been alluded to that goes on and reaches its maximum in two, four or six weeks, and then passes away. But it is possible that some of these cases would be brought to relative recovery, at least that useful vision could be preserved. And the way they will be recognized early is by recognizing particularly the unconsciousness and the violent gastro-intestinal irritation that usually precedes the blindness, the violent vomiting, retching and complaint of violent abdominal pain that precede or accompany the early hours of blindness. After I saw the case with Dr. Thompson I suggested that these cases of poisoning by Jamaica ginger were due to wood alcohol. In 1894 and a year later Dr. Harlan of Baltimore published his very careful investigation into the character of these essences that were causing cases of blindness in the vicinity of Baltimore, and demonstrated that without doubt it was the wood alcohol.

Dr. J. J. Kyle, Indianapolis.—I might suggest that these cases take on a medico-legal aspect. For instance, here is an individual that is picked up unconscious on the streets from the effect of methylic alcohol; probably he is a little hilarious, has been struck by a policemen, taken to the station-house, and the man is blind in a few days, or an optic neuritis begins. It is very necessary under such circumstances that we secure a very complete history of these cases when they come under observation. Not long ago I was consulted by the chief surgeon of one of our large railway systems and their assistant attorney, and they asked me the question if by the administration of any drug could there be brought about an atrophy of the optic nerve. You can readily understand they had a case in mind. They probably might assume that this man was intoxicated, and by an injury during a railway accident went suddenly blind. Was the railway responsible or was the man responsible for the loss of sight? I believe there is a field for further investigation in the medico-legal aspect.

Dr. A. Alt, St. Louis.—Dr. Jackson said that the symptoms in Dr. Reynolds' and similar cases are so characteristic that he could make the diagnosis at once that wood alcohol poisoning had taken place. I doubt if we can affirm as much as the doctor did, because I have seen cases of toxine poisoning, as from foul fish and meat, present the same symptoms at first. The symptoms are very much alike; although I also believe that in his case Dr. Reynolds had to deal with one of methylic alcohol poisoning.

Dr. Derrick. T. Vail, Cincinnati, O.—I have a little experience in this. I have seen three cases belonging to the same class. One case was a man whom I saw almost when the attack came on, that is, twenty-four hours after the onset of the symptoms. He was just recovering from absolute deafness, was entirely blind, crazy and did not know where he was. He had imbibed a quantity of whiskey and quinine from a corner drug store. That case was singular to me on account of the fact that, although I saw him within forty-eight hours after he began taking this crude nostrum of quinine and whiskey, there was already a most marked atrophy of the optic nerve and narrowing of the vessels, so that I could not but believe that he had been blind, or partially so, for months and

years. The arteries were reduced to the merest lines. The optic disc itself was quite atrophic in both eyes; could not tell day from night. He was also deaf. After a few days of quiet his hearing returned and his sight improved. The case has been reported. It especially affected the papillo-macular bundle. The second case came to me in my own practice and was the case of a man who became blind from quinine and whiskey taken fifteen or twenty years ago after an attack of fever and ague. The appearance of the optic disc and some of the blood vessels was peculiar and to me quite interesting. He had a central scotoma and a peripheral contraction of the field. The third case I saw about a month after the blindness had partially and the deafness had completely passed away. There was likewise atrophy of the disc and the same field, only the central scotoma was not so large. Vision $^{20}/_{70}$. There was also contraction of the periphery of the field. I regard this as the typical field in cases of toxic amblyopia.

Dr. Dudley Reynolds, Louisville (in closing).—I am grateful to the gentlemen who have favored me with their discussion. Dr. Brunson considers my first case a typical case of wood alcohol poisoning, yet he makes no mention of the central scotoma always present. He also fails to mention that in peripheral varying of the field in alcohol poisoning the picture is, as Dr. Vail says, symmetrical—not absolutely, but nearly so. In my case the temporal portion of the field was absolutely blotted out in the right eye and only an extremely small portion in the nasal side. In the left eye the contraction was irregular on both sides, and no evidence of central scotoma. A patient who can barely count fingers and has no color perception necessarily presents some difficulty in determining a central scotoma, but if it were alcohol poisoning it would be complete and not like in tobacco amblyopia, where the scotoma is incomplete. These cases in this respect differ from the typical cases of wood alcohol poisoning, as I understand it. Dr. Brunson mentioned the facts "as nearly as he could remember" that he had read of a case of cinnamon poisoning. If it is true that wood alcohol is used in making these essences, then the drug by which the name of the essence goes manifestly has no

effect. The cases are reduced to the plane laid down by some of the gentlemen in the discussion; but I do not think my case was so plain as Dr. Jackson and some of the others did. Yet I have no means of knowing with what kind of alcohol this essence was made. I investigated this subject of the effect of toxic drugs on the visual perceptions and published a paper in 1874 or 1873 in the *Nashville Journal of Medicine and Surgery*. I looked up the literature a little and had had some experience and cases of alcohol poisoning were mentioned. Poisoning by quinine, etc., was mentioned. In these the contraction of the peripheral field is the only phenomenon. In the case of Dr. Würdemann the fields show an extremely minute central scotoma and the peripheral contraction is perfectly symmetrical; and that is like the classical cases in the literature on the subject. In all the cases of quinine blindness I have seen, and I have seen a good many, there was symmetrical contraction of the field. I have seen no case of alcohol amblyopia that did not present a central scotoma.

Dr. Stillson, closing the discussion.—I would be glad to have some help along the lines of the paper I read in determining the physiological departure that we term pallor in these cases where we have amblyopia without total blindness when drugs, alcohol or tobacco must be ruled out. I do not know the experience of others in this field but it seems to me I surely have been unfortunate in running across a number of these cases, or else my judgment has been in error. But I certainly have seen such cases where the alcohol must be ruled out. I have not had any case of wood alcohol blindness come up in my private practice, but I have a marked case now where alcohol and tobacco both are the cause of the amblyopia. I should also like to get some help, if possible, as to the question which I tried to bring out in my paper, concerning the normal size and color of the papilla.

IMPLANTATION OF A WIRE BALL WITHIN THE ORBIT.

By OTTO LANDMAN, M.D.,

TOLEDO, O.

THE ball consists of seven verticle complete circles of silver wire and three horizontal complete circles soldered at their intersections. The wire is about one thirty-second of an inch in thickness; although this is immaterial, so long as the ball is substantially made. Three sizes can be used—eleven, twelve or thirteen millimeters in diameter. The eleven millimeter ball will serve in almost any case.

After enucleation or evisceration in the usual way, the ball is introduced with ordinary dissecting forceps, and is held within the sclera or Tenon's capsule and covered with the tissue by means of three or four sutures passed freely through the tissues, conjunctiva and muscles, and securely tied. A coarse black silk suture is to be selected, which will avoid cutting through the parts. The advantages of this form of ball are: Its lightness; the ease with which any jeweler can make one; it obviates the necessity of any specially devised instrument for introducing it, as in the case of smooth metallic spheres; of *most importance* is its solid *retention* within the tissues by granulation tissue springing up between the wires and binding the ball down permanently.

The smooth metallic balls are often extruded, because there is no such arrangement in them to anchor them. The wire ball forms an excellent movable stump, without any sinking in.

These silver wire balls may be obtained from Messrs. Meyrowitz Bros., New York.

CORRESPONDENCE.

HELMHOLTZ AND THE OPHTHALMOSCOPE.

BALTIMORE, April 14, 1902.

Editor AMERICAN JOURNAL OF OPHTHALMOLOGY:

Dear Sir—It is the cuttlefish, I believe, described as a marine mollusk capable of swimming backward as well as forward, and endowed with marvelous dodging capabilities, that when it is hard pressed gets itself out of harm's way by ejecting an inky fluid—by befogging the issue, so to speak. It is a clever device, and, though not heroic, is often effectual, enabling the creature to extricate itself from positions which it finds no longer tenable.

Dr. Burnett (in his communication apropos of Helmholtz and the Ophthalmoscope in the March number of your journal), in trying to make it appear that I had said in my letter in the previous number something entirely different from what he must have known I did say regarding the "fundamental problem of ophthalmoscopy," and, further, in attempting to explain why Helmholtz employed only concave lenses in his opthalmoscope, and why he held that a clear view of the fundus of the eye could not have been obtained with Babbage's instrument because it was not provided with such lenses, furnishes an excellent example of the cuttlefish's muddling method.

Having regard for your space and for the patience of your readers, I shall not attempt the clarifying process, for it is a bootless task, and doubtless when scarce completed would have to be begun anew to meet a fresh outpouring of the same "inky fluid." As the lesser evil, I beg to leave Dr. Burnett in possession of the field which he has so successfully befogged. Very truly yours,

SAMUEL THEOBALD.

ABSTRACTS FROM MEDICAL LITERATURE.

By W. A. SHOEMAKER, M.D.
ST. LOUIS, MO.

EXAMINATION OF OCULAR FUNDI OF ANIMALS.

One of the most remarkable scientific investigations of modern times is now being brought by Dr. Lindsay Johnson, F.R.C.S., to the close of its earlier stages. Some years ago he began to examine the fundi of animals, and betook himself to Jamrach's collection of animals and other menageries, and found the macula lutea present in monkeys, but that it varied with each genus. Following up his clew, he discovered that every family of the mammalian order possessed a distinct appearance of its own in the eye, by which anyone seeing the fundus with an ophthalmoscope would be able to recognize not only the family but the genus of the animal.

He then proceeded systematically to examine all the animals to be seen in the Zoological gardens of London, Antwerp, Amsterdam, Hamburg, and elsewhere; and, as a result of this gigantic labor, he found many new and striking facts. For instance, he realized that certain organs, such as the pecten, were also to be found in a large number of the lower mammals—rodents and marsupials. This, of itself, was an interesting piece of evidence in support of the Darwinian doctrine of evolution; his various discoveries are to be found recorded in the proceedings of the Royal Society.

His method of investigation is interesting. To examine the eyes of the animals it was necessary for Dr. Johnson to darken the cage, to sit beside the animal with a lamp behind his head, and to look through the ophthalmoscope at a distance of half an inch from the animal's eye, for a period of not less than two hours at a time. The total time spent over each animal would vary from eight to sixteen hours.

He examined the eyes of about a thousand animals, and made drawings of about two hundred and fifty, some fifty of which have so far been published by the Royal Society.

In the cases of the larger animals it was necessary to con-

fine their movements. Thus the elephants were chained down. Sacks some eight feet long were made for slipping over the bears. The closed ends of the sacks were next slit with a knife, and as bruin protruded his head he was promptly muzzled and lifted on to the table for eye testing. In the cases of lions, leopards, tigers and large cats, muzzles could not be used, as they frightened the animals nearly to death. He found it advisable to cut off the whiskers of the brutes, as the touching of the whiskers during examination made them snap. Some of the birds were induced to thrust their bills into large corks, and the fishes had to be treated gingerly to avoid their suffocation. The boa constrictors and pythons were thrown into sacks, to circumvent their squeezing propensities, and their heads were held out of sacks by keepers; while with wolves, bears, otters, seals and sea lions, nets were thrown over them and they were twisted into the meshes.—*Ophthalmic Record.*

CAUSE AND TREATMENT OF PHLYCTENULAR CONJUNCTIVITIS.

R. Hilbert (Sensburg) examined 100 children afflicted with phlyctenular conjunctivitis, and found swollen scrofulous glands in 73, scrofulous eruptions in 22, and rachitis in 5 cases. He insists that this association with scrofula is not a mere coincidence, and advocates treating the scrofula as well as the phlyctenule. He has found cod-liver oil and codeine the best constitutional remedies, and uses insufflations of calomel or ung. hrg. flav. in the eye once daily. If codeine is being given internally calomel should not be used in the eye on account of the danger of the formation of corrosive sublimate. The author considers caustics decidedly injurious.

BROWN-SEQUARD INJECTIONS IN THE TREATMENT OF ATROPHY OF THE OPTIC DISC.

B. Castresana (Madrid) has been making a systematic test of this remedy in both gray and white atrophy.

Vision was improved in every case, but not restored to normal. The improvement subsides after the injections are suspended, and he proposes to resume them every two or three months in order to maintain the benefit desired.